

lectures at Liège, and subsequently he came to Paris and entered the "Alliance" factory as a workman. At this factory were built dynamos and arc lamps for lighthouse purposes, and here, as well as at the workshops of Ruhmkorff, where he also worked, Gramme managed to obtain a mastery of the principles of electric currents. The development of the dynamo, although it proceeded rapidly after the discovery of magneto-electric induction by Faraday, had not at that time attained a sufficiently high degree of perfection to give the machine then made any great industrial importance. In 1870, a few years after the discovery of self-excitation by Wilde, Gramme invented the ring armature which has since borne his name. This type of armature had been practically invented before by Pacinotti, a student at Pisa University; but Pacinotti's invention was before its time, and failed in consequence to obtain the recognition it deserved. It was reserved for Gramme, in re-inventing the ring armature, to produce a dynamo which rapidly obtained great commercial importance.

An interesting fact in connection with Gramme's armature is that the English patent was quite inadequate for so important an invention. The reason of this was that at the time the final specification was drawn up Paris was besieged, and Gramme's English agents were unable to obtain all the information they required. Gramme's machine was self-exciting, and combined good commutation with good lamination of the armature core. Also it is noteworthy that, at a time when the principles of the magnetic circuit were not understood, and when it was consequently impossible to design a dynamo mathematically, Gramme's machine had a fairly well proportioned magnetic circuit. Gramme had, without doubt, the engineering mind which is able to feel instinctively whether a machine is well designed or not. Gramme's machines were conspicuous at the Exhibition at Vienna in 1873, at Philadelphia in 1876, and at Paris in 1878 and 1881, and probably owe their success as much to the energy with which they were introduced to the world as to their great intrinsic merits.

Gramme was an Officer of the Legion of Honour and a Chevalier of the Order of the Iron Crown of Austria. In 1897 he was made a Knight Commander of the Order of Leopold, and a banquet was given in his honour at Brussels to celebrate the occasion. He died at his home, near Paris, on January 20, and was buried in the cemetery of Père Lachaise on January 23.

NOTES.

IN consequence of the lamented death of Her Majesty the Queen, and as a sign of mourning, all the meetings of scientific societies announced for the latter half of last week and the whole of this week have been postponed.

THE Amsterdam Genootschap ter Bevordering van Natuur-, Genees- en Heelkunde has awarded the Swammerdam gold medal for 1900 to Prof. Dr. C. Gegenbaur, of Heidelberg. This medal was instituted by the Genootschap in 1880, to be awarded every ten years to the person who in those years made important researches in the sciences cultivated by Swammerdam. It was awarded for the first time, in 1880, to Prof. Dr. C. Th. von Siebold; and the second time, in 1890, to Prof. Dr. Ernst Haeckel.

WE have with deep regret to record the death of Dr. Walter Myers, which took place on January 20 at Pará from yellow fever. It will be remembered that Drs. Durham and Myers went out last June for the Liverpool School of Tropical Medicine to study yellow fever. Both these gentlemen fell victims to their devotion to science, and the latter unfortunately lost his life. The world can ill afford to lose a man of Dr. Myers'

stamp, for not only did he show great promise as a scientific worker, but he had the courage and singleness of purpose to go out in the cause of science and humanity to study a very infectious and fatal disease. Many have courage to face bullets in a moment of excitement, but not all have the nobler courage to face an insidious disease with the coolness and nerve necessary for scientific inquiry.

Science announces that Dr. H. C. Bumpus, professor of comparative anatomy at Brown University, and director of the biological laboratory of the U.S. Fish Commission at Woods Holl, has been appointed curator of invertebrate zoology and assistant to the president in the American Museum of Natural History, New York City. The office of assistant to the president, Mr. Morris K. Jesup, is an important executive position, as the Museum has no scientific director. It was created last year and was filled by Prof. H. F. Osborn, who has resigned in order to devote himself more exclusively to research in vertebrate palaeontology. A further reorganisation of the staff of the Museum has been made. A department of mineralogy has been formed, with Dr. L. P. Gratacap as curator, while Mr. R. P. Whitfield remains curator of geology, with Dr. E. O. Hovey as associate curator. Prof. Franz Boas and Dr. Marshall H. Saville have been made curators, the former of ethnology and the latter of Mexican and Central American archaeology, though Prof. F. W. Putnam retains the head curatorship in the department of anthropology. In the department of mammalogy and ornithology, Mr. Frank M. Chapman has been made associate curator.

A DISCUSSION on the occurrence and detection of arsenic in manufactured products has been arranged for the next meeting of the Society of Chemical Industry, to be held on February 18.

THE Anatomical Society has undertaken to supply the slips requisite for indexing the literature in human anatomy published in Great Britain and Ireland for the International Catalogue of Scientific Literature, which has been set on foot under the auspices of the Royal Society. For this purpose a committee has been appointed, consisting of Prof. Thane, Dr. Arthur Robinson, and the secretary of the Society (Dr. A. Keith).

AT the recent conference of German biologists, held at Berlin, says the *Athenaeum*, a resolution was passed calling the attention of the Imperial Government to the importance of establishing five floating stations on the Rhine for the purpose of biological investigation. Great stress was laid on the practical advantages which pisciculture would derive from these establishments, and it was resolved that if the Government failed to provide the necessary funds, an appeal should be made to the States of Baden, Bavaria, Alsace-Lorraine, Hesse and Prussia.

THE lectures at the Royal Institution of Great Britain will be resumed on Tuesday, February 5, when Prof. J. A. Ewing will deliver his third lecture on "Practical Mechanics (Experimentally Treated)—First Principles and Modern Illustrations"; and on Wednesday, February 6, Prof. R. K. Douglas will deliver his second lecture on "The Government and People of China." The Friday Evening Discourse, on February 8, will be delivered by Prof. G. H. Bryan, his subject being "The History and Progress of Aerial Locomotion."

WE learn from the *Times* that the question of the protection of Stonehenge from further damage was discussed at a recent meeting of the council of the Society of Antiquaries, when a resolution was passed offering to co-operate with the owner of this ancient monument, Sir Edmund Antrobus, for its protection, and suggesting that a scheme might be arranged with that object in view. A copy of the resolution has been forwarded to Sir Edmund Antrobus, and his reply will be considered at the

next meeting of the Society. The general opinion in Salisbury and district is that Stonehenge ought to be purchased by the nation, but the price which was mentioned some time ago is regarded as too great.

THE Right Hon. R. W. Hanbury, M.P., President of the Board of Agriculture, has appointed a committee for the purpose of conducting experimental investigations with regard to the communicability of glanders under certain conditions, and as to the arresting and curative powers, if any, of mallein when repeatedly administered. The committee will consist of:—Mr. A. C. Cope, chief veterinary officer of the Board of Agriculture (chairman); Prof. J. McFadyean, principal of the Royal Veterinary College; Mr. William Hunting, one of the veterinary inspectors of the London County Council; Mr. J. McIntosh McCall, assistant veterinary officer of the Board of Agriculture. Mr. A. H. Berry, of the Board of Agriculture, will act as the secretary to the committee.

It is proposed in Dundee to erect a granite monument over the grave of James Rowman Lindsay, in the Western Cemetery of the city. Lindsay was a very remarkable man, whose memory should not be permitted to fade. He was born in 1799, and taught electricity, magnetism and other subjects in Dundee for many years, dying there about forty years ago. In 1834 he foresaw that "houses and towns will in a short time be lighted by electricity instead of gas, and machinery will be worked by it instead of steam." This prediction was the result of his own observations of effects produced by the electric current, and not merely imaginative suggestions. In 1854 Lindsay transmitted telegraphic signals through water electrically; and when the British Association visited Aberdeen in 1859, he demonstrated the success of his method by transmitting signals across the harbour. He also read a paper upon it, entitled, "Telegraphing without Wires." Sir John Leng has set on foot the scheme to commemorate the genius of Lindsay by a suitable memorial, and there should be no difficulty in raising the modest amount required for that purpose.

ON Saturday night and Sunday last the metropolis, and indeed all parts of the British Islands, were visited by a storm of great severity. The storm approached from the Atlantic so rapidly that very little notice of its appearance was visible a few hours previously. On Saturday morning the centre of a large depression which had passed to the north of Scotland lay over the north of Sweden, and the only indication of the approach of another serious disturbance was that the wind in the south-west of Ireland showed no inclination to veer beyond west. But the telegraphic reports received by the Meteorological Office showed that in the course of Saturday night the wind had rapidly increased, and on Sunday morning the centre of the storm lay near the north of Scotland. Its influence was felt as far as the south of France, and without doubt far to the north of Scotland. The gusts were very violent, and caused much damage to trees and buildings, the pressure at Greenwich amounting to 34.4 lbs. on the square foot about noon on Sunday, which is equivalent to force 11 of the Beaufort notation. By Monday morning the centre of the disturbance lay over the Baltic, but the interruption to telegraphic communication was so great that scarcely any reports from Northern Europe reached this country in time to be available for the ordinary weather forecasts. Smart showers of hail, snow and rain occurred in most parts of the country.

THE Shanghai Meteorological Society has published its seventh annual report, containing much useful information relating to the atmospheric conditions and movements in the far East. As an appendix to the report an atlas is published

showing the mean isobars and the mean directions of the wind for each of the six winter months. The number of stations in the Chinese Empire is too limited to allow of precise information being given, but all that was available, relating to the sea and adjacent shores, has been collected and carefully collated. The average number of storms varies from two in October to four in November, December and January, and five or six in February and March. The general direction of the storm track is E.N.E. with a tendency to bend to N.E. The violence of the storms seldom attains the intensity of a true hurricane; force 10 or 11 of the Beaufort scale is seldom recorded. The report is drawn up by the Rev. A. Froc, S.J., director of the Zi-ka-wei Observatory.

MR. W. McDOUGALL contributes to *Mind* (January 1901) some new observations in support of Thomas Young's theory of colour-vision. The author has attempted a re-examination of the fundamental and comparatively simple phenomena of vision, and he describes in some detail certain phenomena which he designates "the complete fading of visual images" and "the mutual inhibitions of visual images." The author is unaware of any previous mention of these phenomena, and he applies the knowledge derived from their study to an exhaustive examination of the question of a separate black-exciting process, comparable to the processes that excite the sensations of colour. It is shown that the assumption of such a process is unnecessary and groundless.

A SHORT time ago we noticed a paper, by Signor C. Viola, on the law of rationality of indices in crystallography. A much more exhaustive examination of the actual basis of the thirty-two classes of crystals is now given by Mr. William Barlow in the *Philosophical Magazine* for January. Mr. Barlow's proofs are based on the fundamental assumption of a molecular structure combined with a suitable definition of homogeneous structure. This definition implies the existence of points distributed evenly at regular intervals through the mass, such that the aspect of the structure, viewed from all such corresponding points, is the same, but that an inferior limit to the distance between corresponding points always exists. The method of arriving at the thirty-two classes combines some of the arguments used by Sohncke with some of those used by Gadolin and others, and the paper includes a discussion of Haüy's law.

SOME new experiments by M. G. Sagnac on the transformations of Röntgen rays by matter are summarised in No. 157 of the *Bulletin* of the French Physical Society. The study of the electric action of the secondary rays emitted by a body affords a test of the presence of small quantities of relatively active substances such as copper, iron, aluminium. Hence, also, a method of searching for new elements. The energetic absorption of the more active rays from such a metal as platinum in the first few millimetres of adjacent air has been verified directly by rarefying the air surrounding the metal. Finally, a pencil of Röntgen rays discharges a conductor even when it does not pass through the portion of air acted on by the electric field of the conductor. It is sufficient that the rays shall traverse a portion of air separated from the field of the conductor by a Faraday screen (such as a metal gauze), and that there shall be a field of force in the part traversed, of like sense to that due to the conductor. If the charge of the conductor is reversed in sign, the rate of discharge is altered in the ratio of 1 to 10 or 20, but in the absence of the field in the second region no such change takes place. M. Sagnac's explanation of the phenomena is that the ions produced in the second region acquire, under the influence of the external field, sufficient kinetic energy to carry them through the openings of the screen into the region surrounding the conductor.

THE melting-point of gold is an important fixed point in pyrometry, and its exact determination has been attempted by several observers. In this country the electrical resistance pyrometer has been regarded as the most trustworthy instrument, the mean result obtained by its use being given by Messrs. Heycock and Neville as 1061.7°C . In the January number of *Wiedemann's Annalen* there is a further paper on this subject by Messrs. L. Holborn and A. Day. These observers prefer a thermo-couple that has been directly standardised against an air thermometer as their measuring instrument. In their previous papers these authors have described a method in which the melting-point of a small piece of gold wire is determined. On account of the possibility of the result being influenced by the minute amount ($.03$ gram) used, it appeared desirable to redetermine the constant by the crucible method. The temperature of 450 grams of solidifying gold was measured with a thermo-couple in crucibles of graphite, porcelain and clay, the atmosphere above the fused metal being either air, carbon dioxide, or oxygen. The mean result was 1063.5°C . The same sample of gold gave 1063.9°C . by the wire method.

THE Board of Trade has received, through the Foreign Office, copy of a memorandum by H.M. Consul at Milan respecting an electrical smelting process carried on in North Italy under Captain Hassano's patent. The memorandum states that the feature of Captain Hassano's process is the substitution, in the smelting of iron ore, of heat produced by electricity for that produced by coal, and the merit he claims for it is economy. His experiments were begun in Rome, but have now for some time been carried on, under his personal superintendence, by a company formed for the purpose, at Darfo, in the Province of Brescia, where a considerable water-power is available. At the end of last month a commission composed of five well-known scientific men spent two days at Darfo and witnessed a series of experiments. These gentlemen have now issued a very brief report to the effect that they consider the Hassano process to be industrially practical. The Consul states, however, that he has consulted several very competent authorities at Milan who have carefully followed the development of Captain Hassano's invention, and they are all of opinion that as yet no adequate proof has been furnished that the new system will not cost more rather than less than the one actually in use. Moreover, its application, with any prospect of success, appears to be dependent on the possession of a very abundant water-power, at a very low price, for the production of the electric energy, the consumption of which is enormous.

MR. J. B. C. KERSHAW's paper on "The Use of Aluminium as an Electrical Conductor," which was read before the Institution of Electrical Engineers on January 10, contains an account of some interesting experiments made by the author on the durability of aluminium under different atmospheric conditions. The results show that the commercial aluminium at present obtainable is by no means perfectly resistant to atmospheric corrosion, but becomes seriously pitted after ten months' exposure, especially in the air of towns. Unfortunately the scientific value of the experiments is diminished by the fact that, although the aluminium used had only a purity of 99 per cent., no analysis of the samples was made. According to Moissan, pure aluminium is quite stable, but the presence of a very small quantity of sodium destroys this stability. It is to be hoped that Mr. Kershaw, in his further experiments, will carry out a more thorough investigation of this point, as it is one of great importance. The paper shows how enormously aluminium has decreased in cost in the last ten years, until it has now become, by virtue of its cheapness, a formidable rival to copper. Some interesting details are given of aluminium transmission lines which have been, or are being, erected in America, which show that country

to be far in advance of England in this, as in most other, enterprises.

IN the *Victorian Naturalist* for December Messrs. Fulton and Grant record the occurrence of the European shore-crab (*Carcinus moenas*) in considerable numbers in Port Phillip. If, as seems probable, the species is introduced, it is the first instance of the intrusion of a European marine type into the Australian fauna, and the progress of the intruder will be watched with interest. To the same number Mr. D. le Souëf contributes notes on some little known Australian birds' eggs.

IN the January number of the *Zoologist* Mr. T. Southwell, of Norwich, describes a recent visit to the fish-wharf at Lowestoft, in the course of which he shows how much information is to be gleaned with regard to our fish-fauna from such an inspection. Among the uncommon captures was a porbeagle shark nearly eight feet in length. The author adds that all the animals seen at Lowestoft must not be regarded as British, mentioning the case of the so-called prawns of the genus *Nephrops*, large numbers of which are brought in from the North Sea.

To the same journal Mr. G. Leighton contributes an account of an extraordinary "plague" of snakes which has recently occurred in a house at Cefncaeau, near Llanelly, South Wales. During September, according to a newspaper report, the place had become a domicile for swarms of these reptiles. "They crawled over the floors, infested the cupboards, curled themselves together on the furniture, while some more aspiring members of the species climbed the stairs and luxuriated in the comforts of the bedrooms. The human occupants of the house had done their best to rid themselves of these unwelcome visitors, and had waged a war of extermination against them. The snakes continued to come, however, although, as the inspector explained, no fewer than twenty-two were slaughtered in one day." As might have been expected, the species proved to be the common grass, or ring-snake. The eggs from which the twenty-two individuals mentioned above were hatched were probably deposited by the parent behind the oven, or in a hole in the back wall. On taking down a portion of the latter wall no fewer than forty bunches, each containing thirty eggs, were discovered, all being on the point of hatching. There were thus some twelve hundred snakes in an area of a few square feet.

THE December issue of the *Agricultural Journal* of New South Wales contains the conclusion of an interesting communication by Mr. W. J. Allen on olive culture in the Colony, illustrated with seven plates showing the fruit of the various varieties that have been raised there. The author lays great stress on the importance of cultivating only such varieties as have been proved to be suitable to the Australian climate and soil, and are, at the same time, noted for their abundant yield of oil. How great is the difference in the latter respect between different strains is shown graphically by photographs of a series of equal-sized flasks containing the products of equal quantities of olives. In the case of two varieties the yield is a flask and a half, or more, whereas some of the inferior strains yield not more than one-sixth of a flask.

WE have received the fifth of the excellent series of *L.M.B.C. Memoirs* now in course of issue under the able editorship of Dr. Herdman, the present fasciculus, which is by Dr. Hickson, dealing with *Alcyonium*, the zoophyte commonly known as "dead men's fingers." The anatomy, development and physiology of this curious compound form are severally treated in considerable detail, the whole account forming a model of how such a subject should be treated. When an *Alcyonium* colony has all its polyps fully protruded, the whole

organism is in a state of activity; but this could not go on incessantly, and the periodical retraction of the polyps seems to mark intervals of rest. These periods of rest and activity appear to be correlated, not with night and day, but with low and high tides; and it seems probable that *Alcyonium* takes a rest at each low tide, that is, twice in every twenty-four hours. Owing, however, to the unsatisfactory conditions obtaining in aquaria, it has not yet been found possible to ascertain the duration of these periods of repose in a state of nature. The author adds that in a large fleshy mass like *Alcyonium* it is obvious that there must be some general system of circulation, and in the absence of rhythmically contractile organs it is equally obvious that such circulation must be maintained by ciliary action.

MUCH interesting and important information with regard to food-fishes is afforded by the Report of the Northumberland Sea-Fisheries Committee for 1900, edited by Mr. A. Meek. The flat-fishes, collectively, give an average of 231 in the "takes," which is a considerable improvement over the previous year; but this is almost entirely due to an increase in the number of dabs, plaice having diminished to a marked degree, while turbot have, unfortunately, become exceedingly rare along the coast. It is, however, gratifying to notice that the catch of soles shows a slight improvement over those of the two previous years. Very few floating eggs were obtained, the explanation being that the work was done in harbour during summer, and that the fringe of water near the coast is also the fringe of the great area of water outside where the spawning and hatching take place. A short statement by Prof. Brady is made with regard to the pelagic fauna obtained with the eggs, while Mr. Bulman treats of the molluscs, and the editor of the shrimp-like mysids and the curious crustaceans included under the name Cumacea. These latter may seem to have but a remote connection with fisheries; but as they contribute, directly or indirectly, to the food of fishes, crabs and lobsters, their inclusion in the Report is fully justified. The results of the hatching experiments conducted during the early part of the year show that the work of the fertilisation of the ova of ripe fishes caught by the trawlers must be done at sea soon after the capture of the fishes. An experiment in mussel cultivation has been undertaken, the results of which will be published in the next Report.

A FEW particulars concerning the bird-catching industry in the Faroe Islands are given in the *Board of Trade Journal* (January 24). Among the various species which make the isles a country of birds, the following may be specially mentioned: the guillemot, the auk, the puffin and the kittiwake. During a certain part of the summer they appear in such numbers on and around the "fowling cliffs" as to suggest resemblance to a thick snow-storm of living winged creatures. In the Faroe Isles a "fowling cliff" means a perpendicular cliff, the numerous shelves of which are covered with guillemots and auks. The puffin and the kittiwake are also often found here, but not necessarily always. The "fowling cliffs" all face towards the west—that is, from south-west to north-west. There are also perpendicular cliffs facing towards other points of the compass, but scarcely any birds are found on these. The puffin is the most important bird in the islands, and about 100,000 are caught annually. Twenty-four of these birds yield one pound of feathers. A few years ago a number of grouse were let loose on the islands, and it appears that they have thriven well on some of the northern isles, where several flocks may be seen.

A TRIPLE horizontal pendulum of the Rebeur-Ehler type has recently been erected for the study of earthquakes at Hamburg. Dr. R. Schütt, who has charge of the instrument, has

published the first of a series of monthly *Mittheilungen*, dealing with the earthquakes registered during October 1900.

IN a short paper contributed to the Roumanian Academy, and published in vol. xxii. of the *Analele*, Dr. S. C. Hepites describes the Roumanian earthquakes of 1899. They were all of slight intensity, and occurred on January 12, August 6 and 9, October 10, November 13 and December 20.

MR. JAMES MCEVOY reports on parts of Alberta and British Columbia (Geol. Surv. Canada, *Ann. Rep.*, part D, vol. xi, 1900). His observations were made in a traverse of the Yellow Head Pass route from Edmonton, on the North Saskatchewan river, to Tête Jaune Cache. Rocks of Archæan, Cambrian, Devonian-Carboniferous, Cretaceous and Tertiary ages are recorded, as well as Glacial and other superficial deposits. Gold is noted in the Lower Cambrian areas, and some thick seams of coal in the Lower Laramie (Cretaceous) strata.

DR. J. F. WHITEAVES contributes descriptions of some new and imperfectly-known fossils from the Cretaceous rocks of the Queen Charlotte Islands (Geological Survey of Canada, "Mesozoic Fossils," vol. i. part 4, 1900). As he remarks, the progress of palæontological research during the fourteen years which have elapsed since the third part of his work was published, necessitates alterations in nomenclature. A fossil was previously identified as *Ammonites Beudanti*, and placed in the genus *Haploceras*: since then the Ammonite has been regarded as a *Desmoceras*, and more recently it has been referred to the sub-genus *Puzosia*. Dr. Whiteaves deems it prudent to give the Canadian fossil a new specific name, so the Ammonite now stands as *Desmoceras (Puzosia) Dawsoni*. This is a good illustration of the heartrending though needful changes brought about by the detailed study of fossils. A number of new species of Mollusca and Brachiopoda are now described and figured by Dr. Whiteaves. One British species, *Inoceramus concentricus*, is recorded.

AUSTRALIA offers a wide field of work for those experienced in the industrial utilisation of vegetable products. Although the practical value of economic botany remains imperfectly understood throughout the Commonwealth, there are not wanting indications of its approaching recognition as a new and valuable source of national wealth. Recently, in New South Wales, Mr. R. T. Baker, the curator and economic botanist of the Sydney Technological Museum, appeared as a witness before a Royal Commission appointed to inquire into the condition of the western lands of the State. In the course of his examination he produced samples of eucalyptus oil in various stages, extracted from trees in the eastern portions of New South Wales, and stated that the colony now produces eucalyptus oil of the highest quality, fully equal to the best in the market. He said that a large amount of research has lately been made in connection with the flora of that part of the parent State, with very valuable results. For instance, myrticolorin, a new dyeing material, has been obtained from the leaves of the red stringy bark, in addition to the valuable oil extracted from the same source. Out of trees and shrubs in the eastern portion of the State, Mr. Baker has, with the assistance of his staff, extracted camphor, perfumes (such as otto of roses, ionone and cinnamon), dyes, peppermint and cajuput—oils which ought now to be pushed on the market. New South Wales can also compete against India and Bulgaria with its geraniol extract. Mr. Baker's evidence went to show that the vegetable products of the western, or dry country, in New South Wales, possesses an economic value not inferior to those of the eastern or coastal districts. It may be mentioned that there are in the west, as in the east, many millions of eucalyptus trees of various

kinds, the trees and shrubs from which oils, resins, dyes, tans and other products can be obtained being several hundred in number.

THE current number of the *Proceedings* of the Royal Society contains a paper of much interest to all who are devoted to the canine race. It describes Dr. Copeman's successful endeavours to isolate the micro-organism responsible for distemper in dogs. The investigations here recorded are a continuation of work begun some ten years ago by the late Everett Millais at St. Thomas's Hospital. Dr. Copeman has now isolated a small *cocco-bacillus*, growing readily on most of the ordinary culture media at the body temperature, from the exudations from the lungs, the tracheal mucus, and from the nasal secretion of dogs suffering from distemper. A cubic centimetre of a broth-culture of this microbe, injected beneath the skin of the abdomen in a dog weighing 7 kilograms, is sufficient to induce an attack of distemper terminating fatally in about a week from the date of inoculation. A vaccine has also been prepared which Dr. Copeman states can protect dogs against attacks of distemper. This vaccine is procured by heating a broth culture of the bacillus at 60° C. for half an hour, and then adding a small quantity of carbolic acid. An injection of 2 cubic centimetres of such vaccine was apparently sufficient to protect fox-terrier pups weighing about 1½ kilograms when exposed to distemper infection. How long this immunity is retained by dogs has not yet been ascertained, but information on this and other important points connected with this discovery may shortly be expected, as Dr. Copeman tells us that a series of tests on a large scale are in process of being carried out by dog-breeders in this country, as well as in Germany and America.

WE are very favourably impressed with the first number of the *Journal of Hygiene*, which has just been issued. Messrs. Nuttall, Cobbett and Strangeways-Pigg contribute a paper, illustrated with maps, on the geographical distribution of *Anopheles*, the malarial mosquito, in England, and Messrs. Nuttall and Shipley the first part of a paper on the structure and biology of the same insect. Species of *Anopheles* seem to have been met with in all the districts examined, and not only in those where malaria was formerly prevalent. Dr. Klein, dealing with the pathogenic microbes of milk, has found the tubercle bacillus to be present in 7 per cent. of the samples examined, a figure which accords well with our own experience. Dr. Legge discusses industrial lead poisoning, and Dr. Newsholme the utility of isolation hospitals in diminishing the spread of scarlet fever. Dr. Haldane describes an apparatus for the rapid determination of carbonic acid in air. The apparatus is quite portable (the inclusive weight being only about six pounds), and has an accuracy of 0.5 vol. per 10,000. Dr. Haldane also contributes a paper on the red colour of salted meat, and finds it to be due to nitric-oxide-hæmoglobin. This is formed by the action of a nitrite on hæmoglobin in the absence of oxygen and in the presence of reducing agents, the nitrite resulting from the nitre in salting by reduction, probably through the agency of bacteria. When boiled it is changed into nitric-oxide-hæmochromogen. Messrs. Lorrain Smith and Hoskins find that ethylene does not contribute to the poisonous action of coal gas. Dr. Ritchie discusses the artificial modifications of toxins under the influence of acids and alkalies. The *Journal*, which is edited by Drs. Nuttall, Haldane and Newsholme, is to be issued quarterly, and is published by the Cambridge University Press. The present part is illustrated with figures and diagrams in the text, with a double plate illustrating the structure of *Anopheles*, and with a beautiful coloured plate of *A. Maculipennis*.

THE *Reliquary and Illustrated Archaeologist* has its usual well-illustrated articles on various matters of antiquarian

interest. We need only call attention to a paper by Mr. W. Heneage Legge on some churches in the Hundred of Willingdon in Sussex; one by Mr. J. K. Floyer on "A thousand years of a Cathedral Library" (Worcester). Miss Florence Peacocke draws attention to needlework maps, which were sometimes veritable works of art. John Schorne, a mediæval worthy, is the subject of a paper by Mr. T. Hugh Bryant. This popular preacher of the early fourteenth century was accredited a saint by public opinion because he "conjured the devil into a boot." This may be the origin of the popular tavern sign "The Boot," and may also have given rise to the toy known as "Jack-in-the box."

It has been stated that the inhabitants of the Mentawai Islands, which lie off the west of the coast of Sumatra, are more nearly allied to the Polynesians than to the Malays; but in a beautifully illustrated account of these islanders in *Globus*, Mr. C. M. Pleyte denies this resemblance, in which he is certainly corroborated by the illustrations, and states that they are allied to the Battak. Mentawai is derived from the Malay *matiau*, "man," pronounced locally *matawi*. The natives call themselves Tschakalagät. The men and women are tattooed in straight and slightly curved lines, and occasionally bird designs, on various parts of the body, but the men are more ornamented than the women; it is a necessary preliminary to marriage. It is interesting to note the bow and arrow is employed; the arrows used in warfare are poisoned; the blow-pipe is unknown. The religion appears to be shamanistic; men and women may be shamans (Pleyte terms them "priests"). There are numerous prohibitions, or taboos (*punän*). Divination is performed by an examination of the viscera, especially the stomach, of pigs and fowls. The paper is a valuable record of the ethnography of a people practically unaffected by external influence.

THE Canadian Institute could not have chosen a more appropriate way of commemorating the first fifty years of its history than by the publication of the fine memorial which forms vol. vi. of the *Transactions* of the Institute. The papers in the volume cover a wide field of scientific activity, and do honour to Canada. Sir Sandford Fleming, who was the first secretary and the real founder of the Institute, should be gratified at its growth and influence. The Institute has encouraged scientific study and investigation, and their applications to practical results. It has placed a vast amount of varied knowledge at the disposal of the public, and its recommendations have for many years been received with respect in the official as well as the scientific worlds. One subject of great interest, which first engaged the attention of the Institute twenty years ago, and with which the name of Sir Sandford Fleming is prominently associated, is the zone system of time-reckoning. On the action taken by the Institute, a discussion was inaugurated which extended eventually to Great Britain, and afterwards to all civilised nations, with the result that the essential principles of the system recommended have been adopted on all the five continents. Countries are being brought into the zone system one by one, even though all of them have not adopted the twenty-four hour notation. In other matters the Institute has taken the lead, and has contributed in no small degree to the increase of knowledge in letters, art and science in the Dominion of Canada. We can only mention a few of the subjects dealt with in the volume, namely, the geological history of Lake Superior, the decipherment of the hieroglyphic inscriptions of Central America, the magnetic influence of the sun on the earth and on comets, the structure, microchemistry and development of nerve-cells, the cytology of non-nucleated organisms, the anatomy of the orang-outang, and the morphology of the central cylinder in the angiosperms.

THE following lectures will be delivered during February at the Royal Victoria Hall, Waterloo Road, at 8.30 p.m.:—February 5, "Germs, Our Friends and Foes," by Mr. J. E. Purvis; February 12, "The Eastern Hemisphere," by Mr. E. J. Garwood; February 19, "An Old English Chemist of the Seventeenth Century," by Dr. Donnan; February 26, "Life of the Natives of Sarawak," by Prof. Haddon.

THE new volume of "The Englishwoman's Year Book and Directory for 1901" (A. and C. Black) has been overlooked until now. The value of this annual lies in the fact that it is a guide to spheres of activity open to women, and a summary of women's contributions to intellectual progress during the past year. The scientific summary is not complete, but it serves to show that women are assisting in the advancement of many departments of natural knowledge.

THE only journal in the world devoted entirely to the study of ophthalmological refraction is the *Dioptric and Ophthalmometric Review*, published for and by the Council of the British Optical Association. In addition to the articles, abstracts and notes of special value to opticians, the review contains contributions of interest to all students of optical science. We notice, for instance, descriptions of recent optical patents, and the questions set at the examination of the British Optical Association in December.

THE additions to the Zoological Society's Gardens during the past week include three Martinican Doves (*Zenaida aurita*) from the West Indies, presented by Mr. D. Seth Smith; a White-backed Piping-Crow (*Gymnorhina leuconota*) from Australia, presented by Miss Crowder; a Peregrine Falcon (*Falco peregrinus*), European, presented by Mr. Alfred Ficken; a Greater Black-backed Gull (*Larus marinus*), European, presented by the Hon. Mrs. Barnett; a Himalayan Monkey (*Macacus assamensis*) from Northern India, a Mozambique Monkey (*Cercopithecus pygerythrus*) from East Africa, a Two-spotted Paradoxure (*Nandinia binotata*), a Grey Parrot (*Psittacus erithacus*), a Shining Weaver Bird (*Hypochaeris nilens*) from West Africa, a Barbary Wild Sheep (*Ovis tragelaphus*) from North Africa, a Barbary Falcon (*Falco barbarus*) captured in the Red Sea, nine Ceylonese Terrapins (*Nicoria trijuga*) from India, deposited; a Naked-throated Bell-bird (*Chasmorhynchus nudicollis*) from Brazil, purchased.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN FEBRUARY.

- Feb. 1. 6h. 32m. to 7h. 18m. Moon occults D.M. +17°, 1596 (mag. 5'6).
2. 17h. 20m. to 17h. 42m. Moon occults A¹ Cancri, (mag. 5'6).
2. 18h. 57m. to 19h. 47m. Moon occults A² Cancri, (mag. 5'8).
3. 14h. 34m. to 15h. 37m. Moon occults ω Leonis, (mag. 5'6).
9. 17h. 38m. to 18h. 53m. Moon occults B.A.C. 4700 (mag. 5'3).
14. Venus. Illuminated portion of disc = '949, of Mars = '997.
14. Saturn. Outer minor axis of outer ring = 15"·08.
14. 17h. Jupiter in conjunction with the moon. Jupiter 2° 51' S.
14. 19h. 7m. Jupiter's Satellite IV. in conjunction N. of the planet.
15. 11h. 20m. Minimum of Algol (β Persei).
18. 8h. 9m. Minimum of Algol (β Persei).
19. 10h. Mercury at greatest elongation, 18° 6' East.
20. 1h. Mercury in conjunction with the moon. Mercury 3° 29' S.

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21. 6h. 54m. to 7h. 51m. Moon occults 51 Piscium (mag. 5'7).
21. 18h. Mars in opposition to the sun.
22. 10h. 20m. to 11h. 7m. Moon occults π Piscium (mag. 5'6).
24. 16h. 20m. to 19h. 13m. Transit of Jupiter's Satellite III.

BROOKS' MINOR PLANETS.—Referring to the recent note in NATURE (January 3) announcing the discovery of three new minor planets near to Eros, Herr Kreutz publishes, in the current issue of the *Astronomische Nachrichten*, Bd. 154, No. 3682, a telegram from Prof. E. C. Pickering, of Harvard College, saying: "Brooks' asteroids not confirmed on simultaneous plate; stars near position given."

BRORSSEN'S COMET.—In the *Astronomische Nachrichten* (Bd. 154, No. 3681), A. Berberich gives an ephemeris to facilitate the search for the expected return of Brorsen's Comet this year.

Ephemeris for Oh. Berlin Mean Time.

1901.	R.A.	Decl.
	h. m. s.	
Feb. 1	18 59 8	+ 6 11'4
3	54 12	7 15'3
5	50 14	8 7'4
7	47 6	8 49'9
9	44 39	9 24'7
11	42 48	9 53'5
13	18 41 26	+10 17'4

EPHEMERIS FOR OBSERVATIONS OF EROS.

Ephemeris for 12h. Berlin Mean Time.

1901.	R.A.	Decl.	Mag.
	h. m. s.		
Feb. 1	3 43 52'25	+24 52	16'6
3	51 13'94	24 3 56'7	8'6
5	3 58 38'03	23 16 0'1	
7	4 6 3'97	22 28 28'6	8'6
9	13 31'30	21 41 24'2	
11	20 59'64	20 54 48'9	8'7
13	28 28'61	20 8 44'7	
15	35 57'91	19 23 13'0	8'8
17	43 27'24	18 38 15'7	
19	50 56'35	17 53 54'5	8'8
21	4 58 24'94	17 10 10'4	
23	5 5 52'72	16 27 4'3	8'9
25	13 19'36	15 44 37'2	
27	5 20 44'55	+15 2 49'5	8'9

ELLIPTIC ELEMENTS OF COMET 1900 c.—Herr H. Kreutz has computed the following elliptic elements of Giacobini's Comet (1900 c) from the determinations of position made on 1900 December 24, 28, and 1901 January 14. (*Astronomische Nachrichten*, Bd. 154, No. 3682).

Epoch 1901 Jan. 14, Berlin Mean Time.

$$\begin{aligned} M &= 6 \ 45 \ 47'0 \\ \omega &= 171 \ 29 \ 10'6 \\ g &= 196 \ 32 \ 33'8 \\ i &= 29 \ 52 \ 16'9 \\ \phi &= 47 \ 52 \ 35'5 \\ \mu &= 551''914 \\ \log a &= 0'558287. \end{aligned} \quad \left. \vphantom{\begin{aligned} M \\ \omega \\ g \\ i \\ \phi \\ \mu \\ \log a \end{aligned}} \right\} 1901'0$$

The following ephemeris by J. Möller is given in the same journal:—

Ephemeris for 12h. Berlin Mean Time.

1901.	R.A.	Decl.	Br.
	h. m. s.		
Feb. 2	2 22 4	-18 11'6	0'32
6	2 37 29	17 9'6	0'28
10	2 52 10	16 6'4	0'24
14	3 6 10	15 3'0	0'21
18	19 33	13 59'8	0'19
22	32 21	12 57'5	0'17
26	3 44 40	-11 56'8	0'15

Observations of the Comet by R. G. Aitken with the 36-in. Lick refractor showed it as irregular in outline, with a condensation south—preceding the centre, and a small fan-shaped extension in the north—following quadrant.